"PUDENDAL HERNIA."

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Early in the nineteenth century Sir Astley Cooper described for the first time a hernia to which he gave the name of "pudendal hernia." As the name implies, this hernia is located in the region of the pudendum. This name is, however, incorrect for the following reasons: (1) because the name does not sufficiently differentiate a pudendal hernia from the very common oblique inguinal herniæ of large dimensions, which also occupy the pudendum, and (2) because, contrary to our usual custom, the name is derived from the ultimate resting place of hernia and not from the point of its escape out of the abdomen. A much more preferable name would be "subpubic hernia," a name first proposed by von Winckel and one which describes the salient point of the hernia, namely, that it escapes behind or underneath the pubic bone even in the absence of any other descriptive qualifications. In spite of the great rarity of this hernia the name appears to be universally adopted, and it is hardly worth while to make very strenuous efforts to change it.

A number of years ago there was referred to me a patient with a pudendal hernia who had undergone the usual vicissitudes attending the treatment of such herniæ. I have refrained from publishing the case before because I wished to report in addition to the hernia also the late result of an operation of a somewhat novel nature:

Mrs. E. L., aged forty-one years, was referred to me by Dr. S. Steiner, May 15, 1913. The history prior to 1895 is irrelevant. The patient was delivered by forceps November 18, 1895, at the termination of the first pregnancy. The indication for the use of the forceps is not quite evident to me because the pelvis and all its diameters are apparently of ample size. Shortly after delivery a mass protruded from the vagina, and coincidently with it an incontinence of the bladder was also noted. The condition was at first looked upon as one of paralysis of the bladder and a good prognosis was given. The condition, however, did not improve, and after being seen by a number of consultants she finally came into the care of Dr. F. Lange, formerly of this city, who diagnosed for the first time a vaginal rupture of the bladder, with complete loss of the urethra and also an ununited fracture of the left pubic bone. Since that time the patient was operated on a number of times. I will mention here only those operations of a major nature:

The first major operation was undertaken December 30, 1895, and surprisingly was perhaps the one followed by the greatest amount

of success. It consisted in a closure of the defect of the bladder and the formation of a new urethra out of the left labium minus. After this operation the patient regained control of the bladder.

The second major operation was undertaken May 10, 1896. The previously mentioned vaginal protrusion, which the operator recognized as a hernia, was pushed back and the opening closed by some sort of a vaginal plastic. This operation was not in the least successful; the hernial protrusion recurred immediately, whereupon the patient was informed that before another attempt at its radical cure could be made it would be absolutely necessary to first repair the fracture of the pubis.

The third major operation was therefore undertaken in January, 1897. The patient was told that the ends of the fractured pubic bone were refreshened and sutured with silver wire. Unfortunately the wound became infected and had to be reopened. Intractable sinuses formed throughout the length of the incision until the silver sutures were removed about six months later; at the same time another unsuccessful attempt was made to cure the hernia by a vaginal operation. This may therefore be called the fourth operation.

A fifth unsuccessful attempt at a cure was undertaken in June, 1899.

Thereafter the patient abandoned all hope at a cure for nine years.

In 1908 the patient again became pregnant and was delivered prematurely by a breech presentation. After this confinement the hernia increased markedly in size; it also became evident, for the first time, that the hernia contained not only the bladder but also intestines. The patient was a total invalid; she became bed-ridden and suffered a great deal of pain and untold inconvenience from the hernial protrusion; a particularly annoying symptom was the inability to empty her bladder unless she first reduced the hernia manually.

She therefore readily consented to a sixth attempt at a cure, which was undertaken March 31, 1913, by Dr. Robert Abbe, to whom I am indebted for the following notes: This operation was the first attempt at a cure by the abdominal route. The hernia in the depth of the pelvis was exposed; its contents were found to be the bladder and about three feet of small intestines. These as well as the hernial sac were drawn back, and after putting the sac on the stretch to the utmost, the opening was repaired by a sort of cystopexy, the bladder being fixed by six sutures of Pagenstecher linen to the peritoneum and fascia of the anterior abdominal wall. For a while this seemed to fulfil the intended design; however, soon after the patient was permitted to be up and about the condition recurred.

I saw the patient for the first time May 15, 1913. My physical examination revealed the following status: A well-healed median abdominal scar. A protrusion in the left labium, about the size of an

adult fist was noted; this protrusion was dull on percussion and imparted an impression of translucency; it was reducible, but upon the slightest attempts at reduction the patient felt an uncontrollable desire to urinate. The swelling was so large that its mesial surface, having pulled the vagina down, was covered with mucous membrane. The introitus vaginæ was crescentic, with the convexity toward the right. The left labium minus was absent (result of previous operations). The vestibule of the vagina was so distorted that at first I was entirely unable to find any urethra; finally, after a great deal of search, I was able to discern an orifice or, better said, the opening of a fistulous tract high up, hidden underneath the symphysis, which on probing led in a tortuous manner upward and to the left into the bladder. The entire vagina was occupied by a protrusion which came down along its left side. When the mass was reduced there was to be felt to the inner side of the descending ramus of the pubis a longitudinal hiatus, easily admitting four fingers. The internal organs were negative to palpation.

The history and the physical findings were not very encouraging for a radical cure. The patient, however, was so willing, and even insisting, that I finally acquiesced to her pleadings and consented to make another attempt in a manner not hitherto tried.

This operation was performed May 27, 1913. Median laparotomy extending from the symphysis pubis to one inch above the umbilicus. Massive adhesions were encountered at the site of the last operation. After liberating the adhesions it was seen that the hernia was of the sliding variety, involving the left half of the bladder. This was very discouraging, because at the very outset it prevented me from at least extirpating in a thorough manner the hernial sac, as I had hoped to do. The small intestines were adherent in the depth of the sac and were freed.

The hernial ring was a large, irregular oval, easily admitting the folded hand, and was bounded externally by the ascending ramus of the pubis and mesially by the soft tissues of the bladder, uterus and vagina. The problem of a cure therefore resolved itself into the question of my ability to close this opening; neither pelvic fascia nor levator ani were available. I believe both were ruthlessly torn away at the original forceps delivery. I therefore deliberately carried out an operation I had evolved in advance, namely, to dislocate the uterus and to use it as a plug for the hernial opening.

In order to enable me to do so I first extirpated the right ovary and both tubes. After incising the pelvic peritoneum anterior to the left broad ligament the uterus was dislocated into an extreme sinistroversion and fastened in its new position with a number of Pagenstecher sutures to the descending ramus of the pubis. Had the uterus been only a trifle larger or the hernial ring only a trifle smaller it would have been possible to close the hernial ring completely; as it was, the lateral portion only could be obliterated, and no

matter what I did there still remained a weak area to the right of the dislocated uterus which could not be closed. The best I could do under the circumstances was to pull up the vagina and bladder and suture these organs to the dislocated uterus. The duration of the operation was two hours. The convalescence was exceedingly stormy; the patient vomited almost continually for a number of days. Temperature and pulse, however, remained normal. Primary union resulted and the patient was discharged June 19, 1913.

I kept the patient under observation, and for some time after the operation she was quite comfortable. However, about one year after operation I found on examination that the uterus was again in its normal vertical position, no more sinistroverted, and that there was again a hernial bulging. I heard from the patient the last time, just one year ago, at which time the hernia had recurred to practically its former dimensions.

As is seen I was not any more successful in curing the patient than my predecessors. This is due to a number of causes: (1) because my case was a traumatic one and that in consequence the hernial opening was of such dimensions that it simply could not be closed up with any one of the tissues normally present and normally available for the plastic part of the operation. It is on that account that I thought of utilizing the uterus, so to say, as a plug to stop up the hernial opening. It is true I finished the operation as originally planned, but already during the operation it was seen that the uterus was not large enough to completely close up the hiatus in the pelvic floor; no matter how the sutures were applied or how strongly the uterus was sinistroverted, there always remained a small opening anteriorly, which invited a recurrence. In addition subsequent events show also the fallacy of the operation, as the uterus did not stay permanently fixed in its new position, in spite of the fact that an unabsorbable suture material was used. Within a year's time the sutures had evidently cut through, as the uterus was found to have returned to its normal position. The mediocre ultimate result was, I believe, due to the extensive pelvic denudation, and deposit of cicatricial tissue.

Pudendal hernia is one of the rarest forms of hernia. After a careful search of the literature I have been able to find only the following valid cases:

Cooper,[1] in his treatise on *hernia*, devotes a special chapter to the subject of pudendal hernia, and describes the following two cases:

CASE I (Cooper).—This case was a female, aged twenty-two years, who had a hernia, the size of a pigeon's egg, for a long time, and which she had always been able to reduce. When Cooper saw the patient he found a swelling, situated below the middle of the

[1] The Anatomy and Surgical Treatment of Crural and Umbilical Hernia, etc., London, 1807.

labium, while the upper part of the labium and the inguinal ring were free from any swelling. The tumor extended upward and alongside of the vagina, nearly as far as the uterine os. The hernia gave an impulse on coughing. Cooper succeeded in reducing the hernia by taxis; in doing so the hernia disappeared upward with a gurgling noise, with relief of all the symptoms. After reduction of the contents the labium was flaccid and a finger introduced into this flaccid sac could be passed upward into a circular orifice on the inner side of the ischium, between it and the vagina. Subsequently a T-bandage was used to retain the hernia.

Epicrisis. I have copied this history practically verbatim from Cooper. In spite of the brevity of the report there is not the slightest doubt that the case is a true case of pudendal hernia. It is regrettable that the anatomy of the hernial ring is not described in more detail.

CASE II (Cooper).—This case is merely mentioned in connection with the former; the report of the same is even shorter. It also was in a female who had a tumor similar to but smaller than the preceding and situated in the right labium. It disappeared in the recumbent posture but reappeared promptly when the patient stood up. It dilated on coughing.

Even before Cooper's time I find recorded 2 cases which may have been cases of pudendal hernia. All writers upon the subject of pelvic herniæ in general quote both cases as perineal hernia; the description is not sufficient to enable me to decide the question definitely. For the sake of completeness I have deemed it best to include them in my list of cases, but have decided to at least signify my doubt in their validity with a question mark. The 2 cases are the following:

CASE III (?) (Méry[2]).—The hernia was found in a female five or six months pregnant; it was somewhat larger than an egg and disappeared on compression. The contents were evidently bladder.

Epicrisis. Von Winckel includes this case in his list of pudendal herniæ. He, however, doubts the correctness of his action, as he adds that the description of the case is not sufficient to differentiate it from an ordinary vaginal cystocele.

CASE IV (?) (Curade[3]).—The patient was a female, aged twenty-three years, who was six months pregnant. On examination a lateral perineal tumor was found which increased in size on standing or when the patient refrained from urinating for a long time. It was soft and painless. When compressed manually there arose a desire to urinate, and if pressure was continued urine was actually pressed out. After confinement the hernia disappeared, but it returned in

[2] Mém. de l'acad. royale des sciences pour l'annes, 1739. Original not obtainable. History is abstracted from Ribes. Dictionnaire des sciences médicales, xl, 384.

[3] Mémoires de l'acad. royale de chir., 1769, ii, 25.

a subsequent pregnancy. Curade states that he has no doubt that the case was one of perineal hernia.

Epicrisis. The case was either perineal or it was vesical; it could hardly have been both. The description of the physical signs and the findings are so accurate, however, and all point so strongly toward an involvement of the bladder, that I am more inclined to disregard the word perineal used in connection with the case and to place it among the pudendal herniæ.

Chronologically the next case to be reported is that of a contemporary of Cooper, and of a surgeon who has also done much to further our knowledge of the subject of hernia. I refer to Cloquet.

CASE V (J. Cloquet[4]).—Under the title "Sur une Hernie Vulvaire" this author publishes the following case: The patient was a female, aged twenty-four years, who complained of a swelling in the vulva, On examination Cloquet found in the posterior part of the right labium majus a round swelling the size of a large chestnut, which stretched the overlying skin and also extended toward the inner surface of the external genitals; the swelling was slightly tender and extended upward alongside the vagina; it became much more tense on standing and coughing and gradually increased in size. The patient noticed a swelling for the first time only fourteen days previously, and she believes that it was caused by straining at her work and at stool. Cloquet was able to reduce the swelling by taxis, the reduction being accompanied by a gurgling sound. After reduction a finger could be invaginated into the labium, whereupon a rounded opening was noticed between the vagina and the ramus of the ischium. Nothing further was done, but the patient immediately felt relief of her symptoms, nor has the hernia recurred since.

CASE VI (Hartman[5]).—This operator reports that he has performed an autopsy upon the body of a female who had suffered for a long time with symptoms of a vesical calculus. At the autopsy there was found a tumor in the labium which was formed by a prolapsed portion of the bladder.

Epicrisis. It is regrettable that exact autopsy findings are lacking in this case; on that account it is very difficult to differentiate it with precision from an ordinary cystocele.

CASE VII (Hager[6]).—This surgeon, under the caption "Vorderer Mittelfleischbruch bei einem Weibe," describes the following case: The patient was a female, aged twenty-eight years. During her first confinement, which was very difficult, the patient noticed in the middle of the right labium majus a swelling the size of a walnut;

[4] Nouveau Jour. de méd. Redigée par M. Beclard, Chomel, etc. April, 1821, x, 427. Original not obtainable. History is abstracted after Ebner. Deutsch. Ztschr. f. Chir., 1887, xxvi, 101.

[5] Ephemerid naturæ curiosorum. Observatio 71. Original not obtainable. History is abstracted after Jacobson. Gräfe und Walther's Jour. d. Chir., 1826, ix, 399.

[6] Brüche und Vorfälle, Wien, 1834, p. 297.

it decreased in size in the recumbent posture but became larger on standing and walking; it was easily replaced but reappeared promptly. The swelling increased slowly in size during the subsequent four years and then increased suddenly and became painful and softer. Poultices were applied, whereupon the swelling opened spontaneously at two points, discharged a large quantity of blackish fluid and decreased in size. Seven months later, in the course of a second pregnancy, the swelling became more annoying, on which account the patient entered Hager's clinic. At the examination there was found a swelling the size of a pigeon s egg, which occupied the right labium majus. The labium majus had disappeared by being stretched over the tumor. The vagina was pushed over to the opposite side by the pedicle of the swelling, which passed upward between the vagina and the ascending ramus of the ischium. The swelling was very tense and elastic and both painful and tender. Hager diagnosed an anterior perineal hernia (pudendal) which was inflamed and also mildly incarcerated. Under local treatment these symptoms disappeared and finally the patient was discharged just prior to full-term delivery.

CASE VIII (Koenig[7]).—Speaking of pelvic herniæ, this author says that the most frequent form are those which descend alongside the vagina, in front of the transversus perinei, and then make their appearance upon the surface in the labium majus. He saw one such case, which had the size of a man's head. Detailed description is not given.

CASE IX (Von Winckel[8 9]).—In this case the patient was a female who had been confined a number of times; all deliveries were very difficult; the last time instruments (forceps) had been used. Even prior to this last confinement the patient noticed a swelling in the right labium majus. Upon the mesial surface of this swelling another smaller swelling formed, which also increased in size and made quite a projection. On examination a swelling larger than an adult fist was seen occupying the vulva, and more particularly the posterior part of the right labium majus. It was situated anteriorly and to the right of the perineal body, and was bounded externally by the tuberosity of the ischium and anteriorly by the right half of the symphysis pubis. Even on casual inspection it was seen that the swelling was made up of two different parts, namely, an outer one belonging to the labium and an inner one belonging to the introitus. On careful examination the smaller inner swelling was recognized to be the everted Bartholinian gland. In the larger portion, or hernia proper, various structures could be palpated. By manipulation and pressure along the right side of the vagina most of the hernial contents could be replaced into the pelvis; one smaller body, which was taken to be

[7] Lehrbuch der speciellen Chirurgie, Berlin, 1877, p. 201.
[8] Pathologie der weiblcichen Sexual Organe, Leipzig, 1881, p. 282.
[9] Samml. klin. Vortr., No. 397.

the ovary, could not be replaced. Treatment with a pessary and a truss was tried first but was absolutely unsuccessful; von Winckel therefore tried a plastic operation per vaginam, which was followed by a slight improvement, but failed at a cure.

Von Winckel reviews the published cases of pudendal hernia and reports the following additional case.

CASE X.—This patient was a female, aged fifty-one years. At the age of twenty-two years, after being in labor for three days and after many attempts at delivery with forceps, she was delivered by perforation. At the age of forty-six years she noticed accidentally a swelling in the right labium, which gave rise to very few symptoms in the beginning, but did so subsequently. The swelling was reducible, and when reduced an opening could be palpated underneath the symphysis. Von Winckel made many attempts to treat the patient with a truss, but without avail, and in consequence he decided to operate.

The operation was carried out in the following manner: Through a median laparotomy it was ascertained that the intestines were so adherent to the sac that they could not be liberated; therefore the proposed closure of the sac from within the abdomen was abandoned and a ventrofixation of the uterus substituted. For a short while the condition was improved somewhat, but as a recurrence followed very soon the patient was operated a second time. At this operation the sac was split open from below, the contents were reduced and the sac obliterated by suture. The patient was greatly improved by this operation, but not cured completely; a small hernia still remained, which grew only slightly during the next fifteen years.

Von Winckel discusses pudendal herniæ from an etiological point of view and arrives at the conclusion that they are either acquired or congenital. As a case of congenital pelvic hernia he quotes the case of Lacoste.[10] The case was that of a child, aged one and a half months, that had a protrusion "through" the sacrum, opposite the second spinous process, about one and a half inches above the anus. It was the size of a walnut and became more prominent on coughing or crying. In the course of time the opening in the sacrum closed by bone and the hernia disappeared.

Epicrisis. I have deemed it preferable to exclude this case as a true case of pudendal hernia, owing to its meager description and also because I believe that both etiologically and anatomically the case was more likely a meningocele upon the basis of a spina bifida.

Fortified by this case von Winckel reports as a congenital hernia the following case of a male child who at the age of seven days presented alongside the left pubis and in close proximity to the scrotum, an elevation the size of a pigeon's egg, in which intestines were palpable and which were reducible. As in many other cases of

[10] Froriep's Noticen, 1823, iv, 223.

pudendal hernia this case also suffers from the fact that it is insufficiently described; at best it may be said that the case is not fully proved, and for that reason it might be better to exclude it. As it is the case would be the only case of a pudendal hernia in a male, the only one that occurred in a child, and the only one that occurred spontaneously.

A study of these 11 existing cases enables us to make the following deductions:

1. *Sex.* I have been unable to find a single authentic case of a pudendal hernia in the male. It must be said, however, that I do not accept as proved the case reported by von Winckel, which occurred in a male infant seven days old.

2. *Age.* The youngest patient recorded was aged twenty-two years (Cooper's Case I); the oldest patient recorded was aged fifty-one years (von Winckel's Case II), but this patient had had a hernia for a number of years before consulting a physician regarding her ailment.

3. *Side Affected.* In 5 cases the hernia was upon the right side; in 2 cases the hernia was upon the left side, while in 4 cases the side affected is not stated.

4. *Etiology.* Primarily, I presume all those factors which bear upon the etiology of every hernia must be considered to be effective also in pudendal hernia. In addition, however, pregnancy and parturition are evidently of considerable importance in the etiology of this particular hernia. We find, for instance, that in a goodly proportion of the cases it is distinctly stated that the hernia either began during labor, or was noted very soon thereafter. In a few of the latter it is particularly emphasized that the labor was very difficult and often also instrumental, so that the presumption is very strong that the act of parturition and the trauma coincident to it had something to do with originating the hernia.

5. *Surgical Anatomy.* A pudendal hernia makes its escape from the pelvis through an irregular triangular space, which, roughly speaking, is bounded laterally by the descending ramus of the pubis, and perhaps slightly also by the ascending ramus of the ischium, mesially by the vagina, and posteriorly by the transversus perinei. The latter muscle is a very important landmark, because it serves to differentiate a pudendal hernia from a perineal hernia. The space is marked off by three small muscles, namely, externally the ischiocavernosus, internally the constrictor cunei and posteriorly the transversus perinei. Even in a perfectly normal individual this space is a weak part of the pelvic diaphragm.

The internal approach to this space is also somewhat triangular and is bounded mesially by the uterus and bladder, externally by the round ligament, while the base is formed by the linea terminalis of the pelvis. This is approximately the surgical anatomy of a spontaneous pudendal hernia. We have seen, however, that a number of the

reported cases of pudendal hernia were traumatic in nature, the trauma being the act of parturition. What the exact nature of the trauma is it is rather difficult to determine in view of the absence of exact dissections. Judging merely from the nature of the resulting hernia the surgical anatomy can be only guessed at and appears to be a transversely running tear through the levator ani and its two fascial layers, just posterior to the symphysis pubis.

The organ which lies in closest proximity to and practically upon the surface before described is, in the first place, the bladder; it is on this account that we find in pudendal hernia so frequently symptoms referable to the bladder. The portion of the bladder resting immediately upon this space is covered only in part by peritoneum, so that the resulting hernia is usually of a paraperitoneal variety; the sac in consequence is hardly ever a complete one, and the greatest difficulty would be encountered were one to attempt to extirpate such a sac *in toto*. In the subsequent growth of the hernia other organs may find their way into the hernia, but it appears to me to be more than plausible that these would always rest upon the prolapsed bladder. An ovary was felt in the sac by von Winckel. I am of the opinion, however, that there is a greater likelihood of the ovary falling back into the cul-de-sac of Douglas, and that being the case it would be more likely to appear in a perineal hernia.

6. *Physical Signs.* A pudendal hernia usually makes its appearance in the posterior part of the labium majus. It is more or less globular in form and, owing to the frequency with which the bladder forms its contents, it gives one an impression of translucency. The one great characteristic of a pudendal hernia is that its superficial covering is made up of that part of the labium majus which is continuous with the mucous membrane of the vagina. The consequence is that the mesial half of the hernia is covered by mucous membrane and the outer half by integument. Even herniæ of very large size never involve the anterior portion of the labium majus; this is a very important physical sign, because it serves to differentiate this hernia at once from a large inguinal hernia, which has migrated into the labium. An inguinal hernia has a neck running up into the inguinal region and is always covered only by the cutaneous portion of the labium majus. Reduction in inguinal hernia occurs upward and outward in the direction of the external inguinal ring, while in the pudendal hernia it occurs in a direction parallel with the vagina.

On superficial examination a pudendal hernia is most likely to be confounded with a large cyst of the Bartholinian gland. The latter have an identical location, are covered by the same tegumentary structures and are also translucent; they can be readily differentiated, however, by the fact that all symptoms of a hernia otherwise are lacking.

It is hardly likely that a pudendal hernia will ever be confounded with a perineal hernia. It is true that the internal opening

of the two may be very close to each other; in fact, the two are separated from each other only by the transversus perinei. It might be said, therefore, that just when a hernia is in the formative period it would be exceedingly difficult to differentiate the two. In their subsequent growth, however, they take on an entirely different direction and appear upon the surface in widely different locations, namely, in the posterior part of the labium in the pudendal hernia and upon the buttocks in the perineal; there should therefore be no difficulty in differentiating the two herniæ at a stage of full development.

7. *Treatment.* No case of pudendal hernia is on record as having been cured. Of the 11 recorded cases only 2 have been operated, namely, Cases IX and X, both by von Winckel. The case reported by me is therefore the third case in which an attempt at a radical cure has been made by operation. Attempts by means of vaginal or labial plastics must be followed by failures, as no opportunity is given to follow up the two cardial principles underlying the radical cure of every hernia, namely, high ligation of the sac and a closure of the internal hernial ring. I am of the opinion that in spite of the difficulties which may be encountered this can best be attained by approaching the seat of the trouble by the abdominal route. It is perfectly possible, though not yet demonstrated, that in the spontaneous pudendal herniæ there is a well-defined ring, with firm enough structures surrounding such ring, *i. e.*, the levator ani and its superior and inferior fascial layers, which could be utilized for a plastic, with a fair promise of success. In the traumatic cases, however, the outlook for a radical cure is very meager indeed, as has been proved by my case also, in spite of the novel procedure attempted.

STUDIES IN CHOLELITHIASIS.

II. THE CLINICAL RELATIONSHIPS OF THE CHOLESTERINEMIA TO THE PATHOLOGICAL PROCESS.

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This communication will deal with the relationship of the cholesterin content of the blood to diseased conditions of the bile passages, the vast majority of these being accompanied by stone formation.